What is claimed is:

1. A ferroelectric film including a perovskite ferroelectric or a bismuth layer-structured ferroelectric shown by ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$ (wherein A represents at least one ion selected from the group consisting of Li^+, Na^+, K^+, Pb^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Bi^{3+} and La^{3+}, B represents at least one ion selected from the group consisting of Fe^{3+}, Ti^{4+}, Zr^{4+}, Nb^{5+}, Ta^{5+}, W^{6+} and Mo^{6+}, and m is a natural number),

wherein at least four-fold coordinated Si^{4+} or Ge^{4+} is included in the A site ion.

2. A ferroelectric film including a perovskite ferroelectric or a bismuth layer-structured ferroelectric shown by ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$ (wherein A represents at least one ion selected from the group consisting of Li^+, Na^+, K^+, Pb^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Bi^{3+} and La^{3+}, B represents at least one ion selected from the group consisting of Fe^{3+}, Ti^{4+}, Zr^{4+}, Nb^{5+}, Ta^{5+}, W^{6+} and Mo^{6+}, and m is a natural number),

wherein at least four-fold coordinated Si^{4+} or Ge^{4+} is included in the A site ion; and

wherein the ferroelectric film is a solid solution with a dielectric shown by X_2SiO_5, $X_4Si_3O_{12}$, X_2GeO_5 or $X_4Ge_3O_{12}$ (wherein X represents Bi^{3+}, Fe^{3+}, Sc^{3+}, Y^{3+}, La^{3+}, Ce^{3+}, Pr^{3+}, Nd^{3+}, Pm^{3+}, Sm^{3+}, Eu^{3+}, Gd^{3+}, Tb^{3+}, Dy^{3+}, Ho^{3+}, Er^{3+}, Tm^{3+}, Yb^{3+} or Lu^{3+}).

3. A ferroelectric film including a perovskite ferroelectric or a bismuth layer-structured ferroelectric shown by ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$ (wherein A represents at least one ion selected from the group consisting of Li^+, Na^+, K^+, Pb^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Bi^{3+} and La^{3+}, B represents at least one ion selected from the group consisting of Fe^{3+}, Ti^{4+}, Zr^{4+}, Nb^{5+}, Ta^{5+}, W^{6+} and Mo^{6+}, and m is a natural number),

wherein at least four-fold coordinated Si^{4+} or Ge^{4+} is included in the A site ion;

and

wherein the ferroelectric film includes at least one transition element in an amount of 5 to 40 mol% in total, the transition element having the maximum positive valence which is +1 or more greater than the valence of the A site ion of the ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$.

4. A ferroelectric film including a perovskite ferroelectric or a bismuth layer-structured ferroelectric shown by ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$ (wherein A represents at least one ion selected from the group consisting of Li^+, Na^+, K^+, Pb^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Bi^{3+} and La^{3+}, B represents at least one ion selected from the group consisting of Fe^{3+}, Ti^{4+}, Zr^{4+}, Nb^{5+}, Ta^{5+}, W^{6+} and Mo^{6+}, and m is a natural number),

wherein at least four-fold coordinated Si^{4+} or Ge^{4+} is included in the A site ion; and

wherein the ferroelectric film includes at least one transition element in an amount of 5 to 40 mol% in total, the transition element having the maximum positive valence which is +1 or more greater than the valence of the B site ion of the ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$.

5. A ferroelectric film including a perovskite ferroelectric or a bismuth layer-structured ferroelectric shown by ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$ (wherein A represents at least one ion selected from the group consisting of Li^+, Na^+, K^+, Pb^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Bi^{3+} and La^{3+}, B represents at least one ion selected from the group consisting of Fe^{3+}, Ti^{4+}, Zr^{4+}, Nb^{5+}, Ta^{5+}, W^{6+} and Mo^{6+}, and m is a natural number),

wherein at least four-fold coordinated Si^{4+} or Ge^{4+} is included in the A site ion;

wherein the ferroelectric film includes at least one transition element having the maximum positive valence which is +1 or more greater than the valence of the B site ion of the ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$;

wherein the ferroelectric film includes at least one transition element having the maximum positive valence which is +1 or more greater than the valence of the A site ion of the ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$; and

wherein the transition elements are included in an amount of 5 to 40 mol% in the A and B sites in total.

6. A ferroelectric film including a perovskite ferroelectric or a bismuth layer-structured ferroelectric shown by ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$ (wherein A represents at least one ion selected from the group consisting of Li^+, Na^+, K^+, Pb^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Bi^{3+} and La^{3+}, B represents at least one ion selected from the group consisting of Fe^{3+}, Ti^{4+}, Zr^{4+}, Nb^{5+}, Ta^{5+}, W^{6+} and Mo^{6+}, and m is a natural number),

wherein at least four-fold coordinated Si^{4+} or Ge^{4+} is included in the A site ion;

wherein the ferroelectric film is a solid solution with a dielectric shown by X_2SiO_5, $X_4Si_3O_{12}$, X_2GeO_5 or $X_4Ge_3O_{12}$ (wherein X represents Bi^{3+}, Fe^{3+}, Sc^{3+}, Y^{3+}, La^{3+}, Ce^{3+}, Pr^{3+}, Nd^{3+}, Pm^{3+}, Sm^{3+}, Eu^{3+}, Gd^{3+}, Tb^{3+}, Dy^{3+}, Ho^{3+}, Er^{3+}, Tm^{3+}, Yb^{3+} or Lu^{3+}); and

wherein the ferroelectric film includes at least one transition element in an amount of 5 to 40 mol% in total, the transition element having the maximum positive valence which is +1 or more greater than the valence of the A site ion of the ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$.

7. A ferroelectric film including a perovskite ferroelectric or a bismuth layer-structured ferroelectric shown by ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$ (wherein A represents at least one ion selected from the group consisting of Li^+, Na^+, K^+, Pb^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Bi^{3+} and La^{3+}, B represents at least one ion selected from the group consisting of Fe^{3+}, Ti^{4+}, Zr^{4+}, Nb^{5+}, Ta^{5+}, W^{6+} and Mo^{6+}, and m is a natural number),

wherein at least four-fold coordinated Si^{4+} or Ge^{4+} is included in the A site ion;

wherein the ferroelectric film is a solid solution with a dielectric shown by X_2SiO_5, $X_4Si_3O_{12}$, X_2GeO_5 or $X_4Ge_3O_{12}$ (wherein X represents Bi^{3+}, Fe^{3+}, Sc^{3+}, Y^{3+}, La^{3+}, Ce^{3+}, Pr^{3+}, Nd^{3+}, Pm^{3+}, Sm^{3+}, Eu^{3+}, Gd^{3+}, Tb^{3+}, Dy^{3+}, Ho^{3+}, Er^{3+}, Tm^{3+}, Yb^{3+} or Lu^{3+}); and

wherein the ferroelectric film includes at least one transition element in an amount of 5 to 40 mol% in total, the transition element having the maximum positive valence which is +1 or more greater than the valence of the B site ion of the ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$.

8. A ferroelectric film including a perovskite ferroelectric or a bismuth layer-structured ferroelectric shown by ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$ (wherein A represents at least one ion selected from the group consisting of Li^+, Na^+, K^+, Pb^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Bi^{3+} and La^{3+}, B represents at least one ion selected from the group consisting of Fe^{3+}, Ti^{4+}, Zr^{4+}, Nb^{5+}, Ta^{5+}, W^{6+} and Mo^{6+}, and m is a natural number),

wherein at least four-fold coordinated Si^{4+} or Ge^{4+} is included in the A site ion;

wherein the ferroelectric film is a solid solution with a dielectric shown by X_2SiO_5, $X_4Si_3O_{12}$, X_2GeO_5 or $X_4Ge_3O_{12}$ (wherein X represents Bi^{3+}, Fe^{3+}, Sc^{3+}, Y^{3+}, La^{3+}, Ce^{3+}, Pr^{3+}, Nd^{3+}, Pm^{3+}, Sm^{3+}, Eu^{3+}, Gd^{3+}, Tb^{3+}, Dy^{3+}, Ho^{3+}, Er^{3+}, Tm^{3+}, Yb^{3+} or Lu^{3+});

wherein the ferroelectric film includes at least one transition element having the maximum positive valence which is +1 or more greater than the valence of the B site ion of the ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$;

wherein the ferroelectric film includes at least one transition element having the maximum positive valence which is +1 or more greater than the valence of the A site ion of the ABO_3 or $(Bi_2O_2)^{2+}(A_{m-1}B_mO_{3m+1})^{2-}$; and

wherein the transition elements are included in an amount of 5 to 40 mol% in the A and B sites in total.

9. The ferroelectric film as defined in any of claims 1 to 8,

wherein the ferroelectric film includes $Pb(Zr, Ti)O_3$ which includes at least four-fold coordinated Si^{4+} or Ge^{4+} in the A site ion in an amount of 1% or more; and

wherein at least one transition element having the maximum positive valence of +3 or more is included in the A site in an amount of 5 to 40 mol% in total.

10. The ferroelectric film as defined in any of claims 1 to 8,

wherein the ferroelectric film includes $Pb(Zr, Ti)O_3$ which includes at least four-fold coordinated Si^{4+} or Ge^{4+} in the A site ion in an amount of 1% or more; and

wherein at least one transition element having the maximum positive valence of +5 or more is included in the B site in an amount of 5 to 40 mol% in total.

11. A ferroelectric film including $Pb(Zr, Ti)O_3$ which includes at least four-fold coordinated Si^{4+} or Ge^{4+} in the Pb site ion in an amount of 1% or more,

wherein at least one transition element having the maximum positive valence of +3 or more is included in the Pb site;

wherein at least one transition element having the maximum positive valence of +5 or more is included in the Zr or Ti site; and

wherein the transition elements are included in an mount of 5 to 40 mol% in the Pb and Zr or Ti sites in total.

12. A ferroelectric film including $Pb(Zr, Ti)O_3$ which includes at least four-fold coordinated Si^{4+} or Ge^{4+} in the Pb site ion in an amount of 1% or more,

wherein at least one of La and other lanthanoid series ions is included in the Pb site in an amount of 5 to 40 mol% in total.

13. A ferroelectric film including $Pb(Zr, Ti)O_3$ which includes at least four-fold coordinated Si^{4+} or Ge^{4+} in the Pb site ion in an amount of 1% or more,

wherein at least one of Nb, V and W is included in the Zr or Ti site in an amount of 5 to 40 mol% in total.

14. A ferroelectric film including $Pb(Zr, Ti)O_3$ which includes at least four-fold coordinated Si^{4+} or Ge^{4+} in the Pb site ion in an amount of 1% or more,

wherein at least one of La and other lanthanoid series ions is included in the Pb site, and at least one of Nb, V and W is included in the Zr or Ti site, in an amount of 5 to 40 mol% in the Pb and Zr or Ti sites in total.

15. The ferroelectric film as defined in any of claim 11 to 14, further including:

at least one of Nb, V and W in the Zr or Ti site in an amount twice the amount of Pb ion vacancy in the Pb site.

16. The ferroelectric film as defined in any of claims 11 to 14 is included (111)-oriented tetragonal crystals.

17. The ferroelectric film as defined in any of claims 11 to 14 is included (001)-oriented rhombohedral crystals.

18. A method of manufacturing a ferroelectric film including $Pb(Zr,Ti)O_3$, the method comprising:

using a sol-gel solution for forming $Pb(Zr,Ti)O_3$ which includes at least four-fold coordinated Si^{4+} or Ge^{4+} in the Pb site ion in an amount of 1% or more.

19. A method of manufacturing a ferroelectric film including $Pb(Zr,Ti)O_3$, the

method comprising:

using a sol-gel solution for forming $Pb(Zr,Ti)O_3$ which includes at least four-fold coordinated Si^{4+} or Ge^{4+} in the Pb site ion in an amount of 1% or more,

wherein a mixed solution prepared by mixing a sol-gel solution for forming $PbZrO_3$ which includes at least four-fold coordinated Si^{4+} or Ge^{4+} in the Pb site ion in an amount of 1% or more with a sol-gel solution for forming $PbTiO_3$ which includes at least four-fold coordinated Si^{4+} or Ge^{4+} in the Pb site ion in an amount of 1% or more is used as the sol-gel solution for forming $Pb(Zr,Ti)O_3$.

20. A method of manufacturing a ferroelectric film including $Pb(Zr,Ti)O_3$, the method comprising:

using a sol-gel solution for forming $Pb(Zr,Ti)O_3$ in which the amount of Pb ranges from 90 to 120% of the stoichiometric composition of $Pb(Zr,Ti)O_3$.

21. The ferroelectric film as defined in any of claims 1 to 8,

wherein the ferroelectric film includes $Bi_4Ti_3O_{12}$ including at least four-fold coordinated Si^{4+} or Ge^{4+} in the A site ion in an amount of 1% or more; and

wherein at least one transition element having the maximum positive valence of +4 or more is included in the A site in an amount of 5 to 40 mol% in total.

22. The ferroelectric film as defined in any of claims 1 to 8,

wherein the ferroelectric film includes $Bi_4Ti_3O_{12}$ including at least four-fold coordinated Si^{4+} or Ge^{4+} in the A site ion in an amount of 1% or more; and

wherein at least one transition element having the maximum positive valence of +5 or more is included in the B site in an amount of 5 to 40 mol% in total.

23. A ferroelectric film including $Bi_4Ti_3O_{12}$ including at least four-fold coordinated

Si^{4+} or Ge^{4+} in the Bi site ion in an amount of 1% or more,

wherein at least one transition element having the maximum positive valence of +4 or more is included in the Bi site;

wherein at least one transition element having the maximum positive valence of +5 or more is included in the Ti site; and

wherein the transition elements are included in an amount of 5 to 40 mol% in the Bi and Ti sites in total.

24. A ferroelectric film including $Bi_4Ti_3O_{12}$ including at least four-fold coordinated Si^{4+} or Ge^{4+} in the Bi site ion in an amount of 1% or more,

wherein at least one of Nb, V and W is included in the Ti site in an amount of 5 to 40 mol% in total.

25. The ferroelectric film as defined in claim 23 or 24, further including:

at least one of Nb, V, and W in the Ti site in an amount twice the amount of Bi ion vacancy in the Bi site.

26. The ferroelectric film as defined in claim 23 or 24 is included (111), (110), and (117) oriented orthorhombic crystals.

27. A method of manufacturing a ferroelectric film including $Bi_4Ti_3O_{12}$, the method comprising:

using a sol-gel solution for forming $Bi_4Ti_3O_{12}$ which includes at least four-fold coordinated Si^{4+} or Ge^{4+} in the Bi site ion in an amount of 1% or more.

28. A method of manufacturing a ferroelectric film including $Bi_4Ti_3O_{12}$, the method comprising:

using a mixed solution prepared by mixing a solution prepared by mixing a sol-gel solution for forming Bi_2O_3 with a sol-gel solution for forming TiO_2 at a molar ratio of 2:3 with a sol-gel solution for forming a dielectric shown by X_2SiO_5, $X_4Si_3O_{12}$, X_2GeO_5, or $X_4Ge_3O_{12}$ (wherein X represents Bi^{3+}, Fe^{3+}, Sc^{3+}, Y^{3+}, La^{3+}, Ce^{3+}, Pr^{3+}, Nd^{3+}, Pm^{3+}, Sm^{3+}, Eu^{3+}, Gd^{3+}, Tb^{3+}, Dy^{3+}, Ho^{3+}, Er^{3+}, Tm^{3+}, Yb^{3+}, or Lu^{3+}) so that Si^{4+} or Ge^{4+} is included in an amount of 1 mol% or more.

29. A method of manufacturing a ferroelectric film including $Bi_4Ti_3O_{12}$, the method comprising:

using a sol-gel solution for forming $Bi_4Ti_3O_{12}$ in which an excess amount of Bi ranges from 90 to 120% of the stoichiometric composition of $Bi_4Ti_3O_{12}$.

30. A ferroelectric memory comprising the ferroelectric film as defined in any of claims 1 to 17 and 21 to 26.

31. A piezoelectric device comprising the ferroelectric film as defined in any of claims 1 to 7 and 21 to 26.